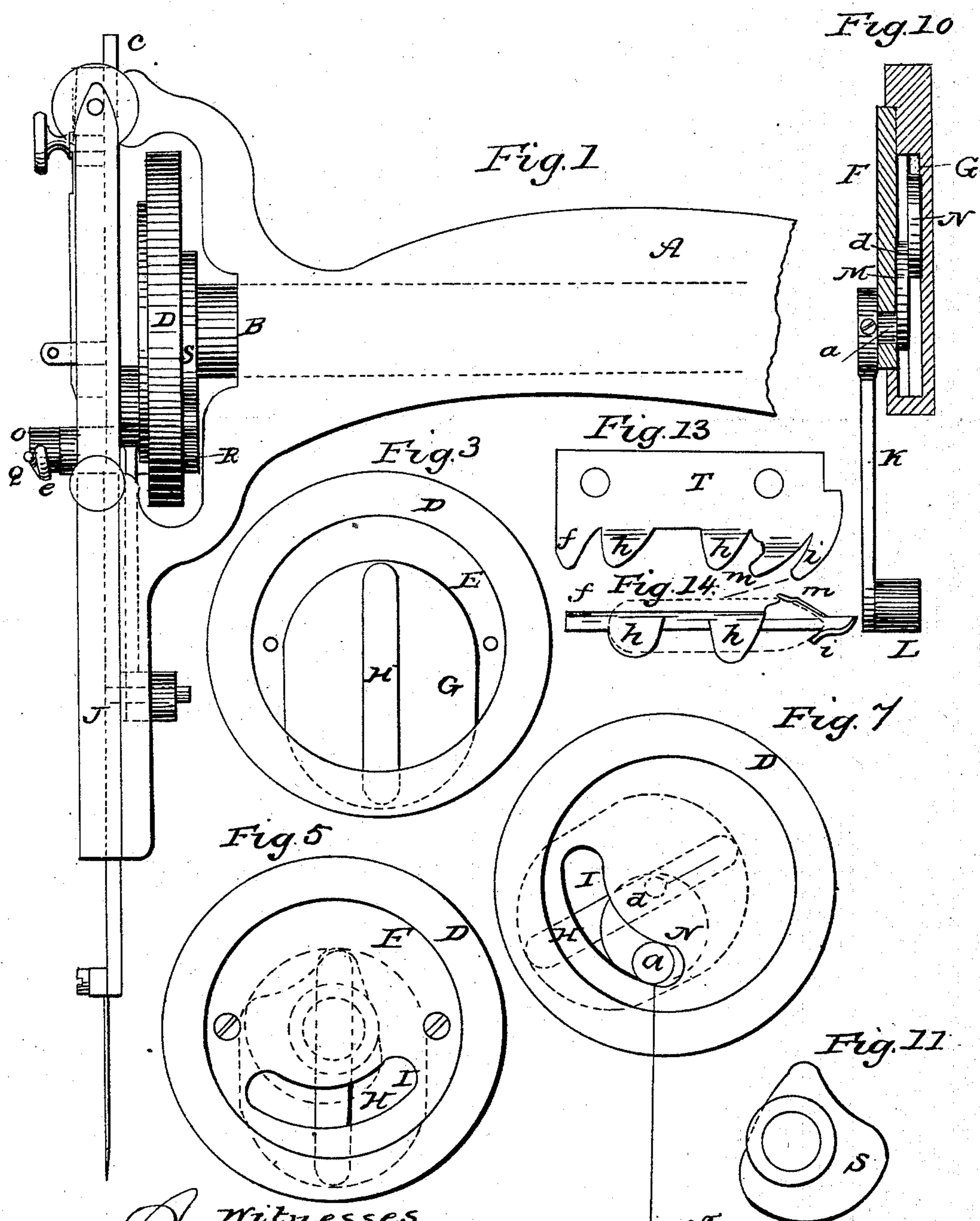


C. F. BOSWORTH.

Sewing Machine.

No. 68,835.

Patented Sept. 17, 1867.



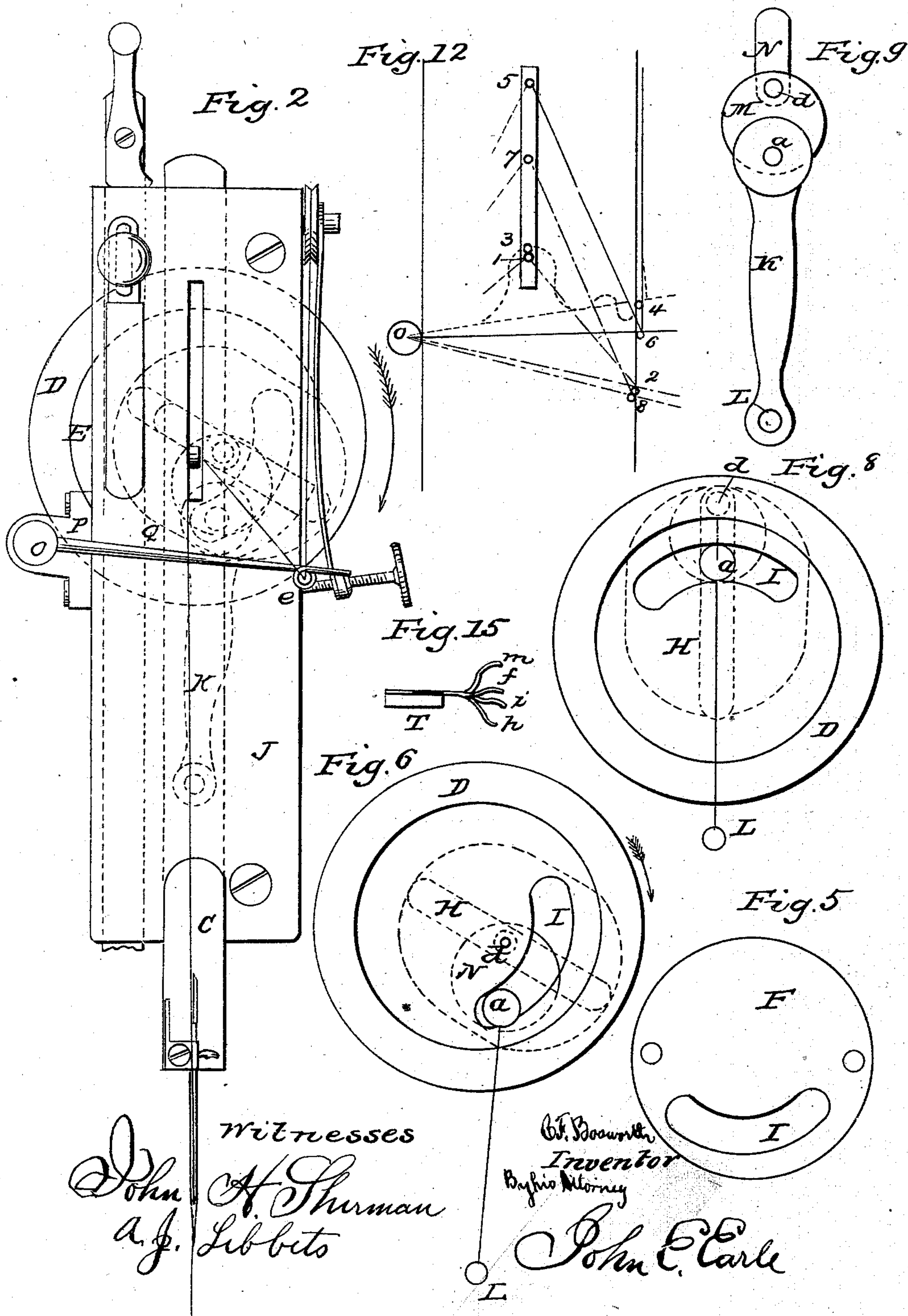
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UNITED STATES PATENT OFFICE.

REISSUED

CHARLES F. BOSWORTH, OF MILFORD, CONNECTICUT.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 68,835, dated September 17, 1867.

To all whom it may concern:

Be it known that I, CHARLES F. BOSWORTH, of Milford, in the county of New Haven and State of Connecticut, have invented a new Improvement in Sewing-Machines; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a side view of the needle-arm; Fig. 2, a front view. Figs. 3 to 10, inclusive, illustrate the construction and operation of the mechanism for moving the needle; Figs. 11 and 12, the take-up; and in Figs. 13, 14, and 15, the shuttle-carrier.

This invention relates to an improvement in that class of sewing-machines in which the needle is moved in a vertical slide; and consists, first, in the peculiar construction of the mechanism which operates or moves the needle; second, in the peculiar construction and arrangement of a positive take-up; and, third, in an improvement in the shuttle-carrier, whereby the shuttle is more steadily held than in carriers of common construction.

In order to the clear understanding of my invention, as well as to enable others to construct the same, I will proceed to a description thereof, as illustrated in the accompanying drawings.

A is the arm, within which is arranged, in proper bearings, a shaft, B, driven in the usual manner, to impart motion to the needle-slide C. Upon the end of the shaft B is fixed a plate, D, (see Fig. 3,) also seen in section, as denoted in Fig. 10. A recess, E, is formed in the face of the plate D, into which a second plate, F, is fitted, and within the recess E, and beneath the plate F, a second recess, G, is formed, as seen in Fig. 10; and centrally through the recess G is formed a slot, H, also seen in Figs. 3 and 10, and through the plate F is formed a slot, I, eccentric to the center of the plate F, as denoted in Fig. 4, and the said plate F is placed into the recess E of the plate D, as seen in Figs. 5 and 10, so that the recess I in the plate F crosses the slot H, as seen in Fig. 5. The needle-carrier C is arranged to move vertically within a guide, J, in the usual manner. A connecting-rod, K, is attached to the needle-bar C, denoted in broken lines, Fig.

2, and seen detached in Figs. 9 and 10, and is pivoted to the bar at L. A plate, M, is formed so as to lie in the space G between the two plates F and D, as seen in Figs. 2 and 10. A stud, A, is fixed to the plate M, so as to pass through the slot H, and upon the outside of the plate F, to the said stud, the connecting-rod is firmly fixed, so as to practically make the plate M a fixed part of the rod K. Upon the opposite side of the plate M, and in line with the point of connection L and stud a, is pivoted at d a shoe, N, (see Figs. 9 and 10,) which said shoe fits into the slot H, and so as to turn freely on its pivot d.

The operation of the needle-driver thus constructed is illustrated in diagrams, Figs. 6, 7, and 8. As in Fig. 6 it is represented as the needle at its lowest point, the shoe being denoted by the blue line, the slot H in broken lines, and the slot I in solid lines, the plate N also in broken lines. Revolving in the direction denoted by the arrow, the slot I rises slowly toward the center to the position denoted in Fig. 7, the shoe being carried over upon its pivot d by the slot H, thus passing through about one-third of its full revolution, and rising only so much as the slot I approaches the center of motion of the plate D, giving sufficient time for the passage of the shuttle through the loop, the slight raising of the needle being given for the purpose of opening the loop for the ready passage of the needle therethrough. From this point—that is, as denoted in Fig. 7—the plate, continuing its revolution, causes the stud a to be carried up, and the operation of the shoe in the slot H, when arrived at the point denoted in Fig. 8, raises the needle to its highest point, and in such movement the operation of the shoe in the slot H is to advance the needle faster than the velocity of the plate, so that the stud a, when in the position of Fig. 8, stands in the center of the slot I, thus making the movement up very quick, and, continuing its revolution, is in like manner quickly moved down, the stud a quickly advancing to the slot I, as seen in Fig. 6.

It will be observed that a stud at d, to move in the slot H, would answer the same purpose as the shoe N, yet the operation of the shoe turning upon the pivot is much more perfect than could be attained by the stud.

This construction gives to the needle the most

perfect and easy movement, starting slowly from its lowest point to rise, and, rising in advance of the velocity of the machine, passes easily over its upper dead-center and down to its lowest point also in advance of the velocity of the machine, and resting nearly or quite stationary while the shuttle passes through the loop. This completes the first part of my invention.

The second part of my invention, which relates to the take-up, is illustrated in Figs. 1, 2, 11, and 12. Upon the shaft O, arranged in proper bearings P on one side of the guide J, is fixed an arm, Q, extending across the face of the guide, and having in its opposite end an eye, *e*. The shaft O extends back, so that an arm, R, (see Fig. 1,) attached to the other end of the shaft O, extends inward and bears against a cam, S, on the shaft B, the thread passing through an eye, *d'*, on the needle-slide C, as denoted in Fig. 2. The said cam S is shown detached in Fig. 11, and is formed so that when the shaft B revolves to operate the needle, as before described, the cam will give to the take-up the necessary movement to slacken or tighten the thread, as required. The take-up (acting in combination with the eye *d'* in the needle-slide) is illustrated in the diagram in Fig. 12. Starting from the same point as described for the movement of the needle, the lowest point of the needle is represented at 1 in blue, the take-up in blue, the eye being at 2. The needle rises as the stud *a* passes through the slot I to the position at 3, denoted in black broken lines, and while the needle is moving this short distance the take-up rises to the position denoted at 4, also denoted in broken black lines, in order to give sufficient thread for the free passage of the shuttle, the loose thread being denoted by broken black lines. The needle then quickly rises to its highest position, denoted in black, and the take-up falls to the position denoted at 6, which draws up the thread. From this point the needle and take-up move at nearly equal velocity to the position denoted at 7 of the needle and 8 of the take-up, where the take-up rests until the needle arrives at its lowest point, 1. During this last portion of the descent of the needle the take-up rises slightly to the position denoted at 2, sufficient to insure the opening of the loop. Thus, by the peculiar formation of the cam S and the take-up working rigidly thereon, a positive and fixed tension is in-

sured, which cannot be attained by dependents resting upon a spring to operate the take-up. This completes the second part of my invention.

The third part, which relates to the construction of the shuttle-carrier, is shown in Figs. 13, 14, and 15, Fig. 13 being a top view, Fig. 14 an edge view, the shuttle being denoted in red, and Fig. 15 an end view looking from the rear. In this class of machines a great difficulty is experienced from the inclination of the shuttle to tip up when the thread is drawn taut, and more particularly is it so when a strong tension is required. To overcome this difficulty is the object of this part of my invention.

T is the shuttle-carrier plate, having its driver *f* at the rear, its supporting-tongues *h h* extending from the plate below the shuttle, and the return-tongue *i* formed in the usual manner. From the plate T, I extend over the shuttle, in the rear of the point *i*, another tongue, *m*, so as to form a fulcrum, under which the shuttle bears when the thread is drawn taut, as denoted in Fig. 14, the point of the shuttle resting upon the return-tongue *i* as the weight and under the tongue *m* as the fulcrum, wherefore, as the weight and fulcrum are both rigid, the power or tension of the thread fails to raise the heel of the shuttle, and this difficulty is entirely overcome and the object of the third part of my invention accomplished.

Having thus fully described my invention, what I claim as new and useful, and desire to secure by Letters Patent, is—

1. The combination of the slot I in the one plate and the slot H in the other with a connecting-rod, K, constructed with its two bearings *a* and *d*, so as to operate substantially in the manner herein set forth.

2. The arrangement of the positive take-up Q with its cam S, formed relatively to the movement of the needle, and in combination with the thread-eye *d'* on the needle-slide, so as to operate in the manner specified.

3. The arrangement of the tongue *m* upon the shuttle-carrier in the position relative to the return-tongue *i*, so as to operate as described.

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